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Worldwide Report

NUCLEAR DEVELOPMENT AND PROLIFERATION

No. 66

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CONTENTS

WORLDWIDE AFFAIRS

Nuclear Collaboration With Iraq cribed
(Thankmar von Muenchhausen; FRANKFURTER ALLGEMEINE, 23 Jul 80) 1

ASIA

INDIA

'Nuclear Tussle' With United States Analyzed
(Editorial; THE HINDU, 2 Aug 80) 5

West's Policy Blamed for Third World Nuclear Programs
(Editorial; THE STATESMAN, 30 Jul 80) 7

India To Set Up Seven More Heavy Water Plants
(THE WORKING PEOPLE'S DAILY, 20 Sep 80) 9

Uncertainties Delay Atomic Power Growth
(Editorial; THE STATESMAN, 1 Aug 80) 10

SOUTH KOREA

Government Moves Toward Localization of Nuclear Power Plant Facilities
(THE KOREA TIMES, 2 Sep 80) 11

Uranium Exploration Pushed
(THE KOREA TIMES, 30 Sep 80) 13

THAILAND

Briefs

Uranium Pellet Production 14

EAST EUROPE

INTERNATIONAL AFFAIRS

Briefs

CEMA Nuclear Session 15

CZECHOSLOVAKIA

Development and Problems in Pribram Uranium Mines Discussed (Vasil Pjescak, Juraj Stenczel; RUDY, No 7, 1970) .. 16

LATIN AMERICA

ARGENTINA

CNEA Assumes Management of Embalse Nuclear Plant (CONVICCION, 2 Sep 80) 33

WEST EUROPE

FEDERAL REPUBLIC OF GERMANY

Amendments Planned for Law on Nuclear Energy (FRANKFURTER ALLGEMEINE, 5 Sep 80) 36

Ample Uranium Supply Seen Even Without Imports From Canada (Wolfgang Hoffmann; DIE ZEIT, 22 Aug 80) 38

FINLAND

Nuclear Plant Energy Production Fails To Meet Forecasts (HELSINGIN SANOMAT, 27 Aug 80) 40

Briefs

New Soviet Reactor Faults 42

NETHERLANDS

Terwisscha van Scheltinga Explains Antinuclear Stance (Terwisscha van Scheltinga Interview; NRC HANDELSBLAD, 19 Sep 80) 43

VVD Congress Opts for More Nuclear Power Stations (NRC HANDELSBLAD, 6 Sep 80) 47

Briefs

Nuclear Weapons Possession Unacceptable 49

NUCLEAR COLLABORATION WITH IRAQ DESCRIBED

Frankfurt/Main FRANKFURTER ALLGEMEINE in German 23 Jul 80 p 8

[Article by Thankmar von Muenchhausen: "Codenamed 'Osirak': Explosive Franco-Iraqi Cooperation in Nuclear Field"]

[Text] Paris, July--Will Iraq be, 5 years from now, the first Arab country to own atomic weapons? This is a possibility which is taken seriously in Israel. Prime Minister Begin has described as "an alarming development" the cooperation between France and Iraq in nuclear research. According to Yuval Neeman, nuclear physics professor from Israel, and a former high-level member of the intelligence service Mossad, the quantities of enriched uranium that Iraq will obtain from France would be sufficient for eight atomic bombs. Other specialists' estimates are more guarded. The French government is not very happy at the furor provoked by its "friendly cooperation" with Bagdad government. It points out the safeguards linked to passing on radioactive material. It has also pointed out that other countries are also involved too in nuclear dealings with Iraq.

It Started in November 1975

The economically promising nuclear cooperation between France and Iraq, with its explosive political and strategic ramifications, was started by two politicians: Iraqi President Saddam Husayn and Gaullist Jacques Chirac, at the time prime minsiter of France. For the Iraqi, it was a question of establishing his country's supremacy in the Persian Gulf, an objective which has come closer to achievement with the collapse of Iran; for the French, this was a way out of the oil crisis and economic distress. Today, Iraq is France's second major supplier of oil, after Saudi Arabia; and France is Iraq's third trade partner, after Japan and the FRG.

On 18 November1975, the two countries signed an "agreement for cooperation in the peaceful use of nuclear energy" (published in the 18 June 1976 issue of the JOURNAL OFFICIEL). Other Arab oil producing countries, which were striving to get similar cooperation, were left high and dry. From the start, the Iraqis insisted on the highest level of secrecy. Thus, there was no debate in the National Assembly, on an agreement so full of foreign policy ramifications. The agreement was ratified by the foreign ministers' counter-signatures. The deputies had to be satisfied with occasional written questions directed to the minister. At first, the French press paid hardly any attention either. Only after the Paris correspondent of the Israeli newspaper HA-ARETZ had pointed out in September 1976 the risks of the Franco-Iraqi nuclear dealings was attention raised in Israel, then somewhat later in France and the United States. However, until now, the nuclear technology support provided by France to one of the "front line" states which have vowed the destruction of Israel, has not been a subject of attention.

What is involved in this cooperation in this critical Middle East region? Under the code name "Osirak," the Iraqi nuclear research center is being built, under severe security and secrecy measures, south of Bagdad along the road to Basra. France is delivering the two research reactors. The larger one originally named "Osi," but later renamed "Tamuz 1," after a Mesopotamian fertility god, has a power of 70 megawatts, enough to supply electricity to a large city; "Isis," now named "Tamuz 2," serves as back-up facility. "Tamuz 1" is the largest research reactor ever built. Only the French nuclear research center at Saclay, near Paris, has such an installation. The Shah of Iran, frightened by the first Indian atomic explosion in May 1974, had ordered a similar reactor. With his downfall this order has become void.

Project "Osirak," including infrastructures and constructions, should bring some 1.5 billion dollars into the French economy. For the past 4 years, a few hundred Frenchmen have been working in Iraq to build the reactors. In French research centers and technology institutes, dozens of Iraqi physicists are being trained in nuclear science and technology secrets. In the future, 600 Iraqi technicians and scientists are supposed to be trained in the Osirak research center.

By year end, "Osirak" will be completed and it will start to operate in early 1981. "Tamuz 2" is already operational. France is committed to deliver to Iraq "special fissile material," 72 kilograms of highly enriched uranium (93 percent). But in 1978, French nuclear physicists discovered that low enriched uranium (7 percent), so called "Caramel," could also serve as reactor fuel. Since the end of 1979, the Saclay reactor has been operating on such fuel. However, the Iraqis, who signed the Nuclear Non-Proliferation Treaty in 1968, have declined to accept the militarily safe "caramel," instead of the highly enriched uranium, the basic material for nuclear devices. The French gave in.

The first delivery of this dangerous material was dispatched to Iraq a few weeks ago. Is the quantity sufficient to produce an atomic bomb? For obvious political reasons, there is divergent information on this point. On television, a French specialist stated that 20 kilograms of enriched uranium is the minimum required to produce an atomic bomb--a quantity which exceeds that which the Iraqis will control at one time. The foreign ministry in Paris even mentioned 25 kilograms. In contrast to this, French atomic energy authority indicated, when asked, 12 kilograms as the minimum--the amount needed to operate "Tamuz 1." Consequently, the enriched uranium promised by France would be sufficient to produce six atomic bombs, each with a destructive power equal to the one used on Hiroshima. Professor Neeman sees another possibility: "The Iraqis could try to extract plutonium, which would make it possible for them, in less than 5 years, to produce three to four atomic bombs per year."

In the advanced stage reached by project Osirak, Iraq does not depend any more exclusively on its French partners. After the French refused to provide a "hot cell" for the research reactor, where particularly hazardous radioactive material can be handled, the Iraqis turned to Italy and obtained there what they wanted. In return Italian shipyards received a lucrative order, which France had hoped to get. In the "hot cell," plutonium can be extracted from spent uranium fuel. Last January, Iraq has also signed an agreement with Brazil. It provides for delivery of atomic power plants and low enriched uranium. In addition, Brazil will help Iraq with the search and exploitation of its own resources in uranium. In March, Portugal declared itself ready to deliver uranium against pledges of oil deliveries.

Israeli Counteractions

Two setbacks to the Iraqi atomic program thus far have become publicly known. On the night of 6 April 1979, saboteurs entered a building of "Constructions Navales et Industrielles de la Mediterranee" (CNIM) [Mediterranean Industrial & Naval Works], located near Toulon, after placing alarms out of commission and using a skeleton-key to open the door. Using carefully sized explosive charges, they destroyed an essential element --ready for shipment--of the Iraqi reactor, usually referred to as "honeycomb core." The British news magazine NOW has confirmed, citing "secret service sources" in Paris, the obvious; the highly professional action was perpetrated by an eight-man commando from the Israeli secret service Mossad, which keeps close ties with its French counterpart. According to NOW, the Israelis had even considered stealing the "honeycomb cores," bringing them by road to Marseille; but the time available between guard rounds was insufficient.

On 14 June, a few weeks ago, Egyptian nuclear physicist Jachja al Meshad was murdered in his Paris hotel room. The 48-year old Meshad, trained in the United States and Moscow, for several years the head of the Egyptian atomic program, was the director of the Iraqi nuclear energy authority. His predecessor, Iraqi Prof Hussein Shadristani, is in jail. He had been condemned to death last September, but then reprieved and his sentence changed to jail. Allegedly, Professor Shadristani had passed information to Israel. Jachja al Meshad had arrived in Paris in early June to check the first shipment of highly enriched uranium destined for Iraq, and to get acquainted with the safety measures required in handling this hazardous material. It was not his first visit to Paris. Already, the previous December, another bomb attempt on his life had been made in his Paris hotel.

Police kept the murder secret for 4 days to allow time for authorities to appease the always suspicious Iraqis. The only witness of the murder, a prostitute, recently lost her life--before she could give her testimony--in an "ordinary traffic accident" on Saint-Germain boulevard. Coincidence? Curiously, the dead witness's parents, who live in La Rochelle, have been receiving telephonic threats for the past few days which they cannot figure out. The Israelis are not alone on the list of suspects: other enemies or rivals of Iraq, such as Syria and Libya are included. There was joy on Israeli radio, at the news of al Meshad's murder: the Iraqi program had beer set back 2 years. But according to specialists this is wishful thinking.

France is determined to carry on this risky cooperation. In August, Prime Minister Barre will travel to Bagdad followed, before the end of year, by President Giscard d'Estaing. Israel is trying to exert pressure on the French government, through the United States, and through public opinion. Until now, such pressure has had no results. Washington must hear from France that from 75 to 80 percent of the highly enriched uranium currently found in numerous countries, for "peaceful purposes," was delivered by the United States.

Israel is anxiously following this developing situation. It is an irony of history that Israel, a few years ago, also with French assistance, became in all likelihood the first possessor of atomic explosives in the Middle East. Israel knows the dynamics of this cycle, which are being dangerously accelerated by Franco-Iraqi cooperation. Potential enemies were cautioned by former Defense and Foreign Minister Dayan: "Israel will not be the first country to introduce atomic weapons into the region; but we will also not allow ourselves to be surprised unprepared."

9627
CSO: 5100

'NUCLEAR TUSSLE' WITH UNITED STATES ANALYZED

Madras THE HINDU in English 2 Aug 80 p 8

[Editorial]

[Text] It is perhaps too cynical to view the current happenings in Washington on the American nuclear fuel supply to Tarapur as a shadow play drawing to a pre-determined end. For the Carter Administration appears serious enough in its attempt to get the two pending shipments of 19.8 tonnes of enriched uranium each through. Forceful pleas by Mr Moynihan, former Ambassador in New Delhi and now a Senator, and Dr Joseph Nye, the originator of the Carter Administration's approach to non-proliferation, appear to have softened the hardline opponents in the House of Representatives and led to some rethinking. For all its current efforts, the Administration seems to be trapped in a maze of its own making--in its eagerness to demonstrate its commitment to non-proliferation, it tried through the Nuclear Non-Proliferation Act of 1978 to heavy handedly impose controls over the non-nuclear weapons States. New Delhi has consistently refused to yield on full scope safeguards or placing all the nuclear facilities whether indigenously developed or of foreign origin under International Atomic Energy Agency inspection, so long as the nuclear weapons States were free to do as they pleased. And it has been insisting that the U.S. honour its commitment to supply fuel under the Indo-U.S. agreement on nuclear cooperation without trying to impose conditions that are unacceptable to all sections of public and political opinion in the country. The U.S. Administration, with its professed concern for non-proliferation, has chosen to ignore these straightforward arguments and has instead contrived reasons of its own in recommending that the fuel be granted. One is the supposed danger of India, obviously to the detriment of American interests in the Asian region, drawing closer to the Soviet Union if the fuel were denied. Secondly, it has argued that if it were to cut off the fuel, India would repudiate the safeguards arrangement and feel free to use the spent fuel from the Tarapur reactors for reprocessing--a development that would defeat the non-proliferation objective. Embarrassing and not exactly complimentary as these arguments and explanations may be, these are the ones that carry weight in the curiously mixed mood of self-righteousness and bellicosity that has gripped the U.S. But as our Washington correspondent has reported, the Administration still faces a hard task in trying to sell to the Congressmen its line of reasoning as to how providing the nuclear fuel would advance its non-proliferation objective while holding it back might defeat it.

The current debate has clearly brought out the danger of basing India's nuclear development programme on foreign supplies which in this case are also dependent on the political tussels in Washington. The Tarapur reactors are being run way below full capacity--last year they achieved 47.3 per cent--to conserve fuel and the nuclear fuel fabrication complex to Hyderabad has been idle for lack of uranium shipments from the U.S. An alternative mixed uranium fuel developed by Indian scientists has been tested and found suitable and work is under way to build the plants to produce the mix. Without waiting for the outcome of the current happenings in Washington, the Government of India should go ahead full steam, devoting all resources and manpower necessary to produce the substitute fuel that will keep the Tarapur reactors running for some years at least, if the U.S. finally decides to cut off the supply. As with most efforts at indigenisation, this too will not be without substantial costs. But the point is the Indian scientists' ability to keep the reactors going cannot but add to the country's bargaining strength with the U.S.--or any other supplier, for that matter. For if the plants can operate in any case, the U.S. cannot use the fuel supply as a lever to extract assurances and concessions on safeguards. And if the professed objective is to shut off from the rest of the world the wherewithal to carry out nuclear explosions, one would hope that the U.S. would some day realise also the futility of denying fuel to a nation that had six years ago demonstrated its capability to explode a device.

No easy solution appears to be in sight for the larger question of the future of the Indo-U.S. agreement on nuclear cooperation. The dialogue between Washington and New Delhi has dragged on with the parties talking past each other. Except during a brief period when Mr Morarji Desai's renunciation of even peaceful nuclear explosions seemed to presage a softening of India's stand, Washington could have been under no illusion that New Delhi would ever accept full scope safeguards. India is now on strong ground and, if any of the two pending shipments of fuel is denied, the U.S. would be committing a breach of the agreement. The safeguards arrangements at Tarapur will then automatically cease to be binding, though with the Prime Minister's repeated declarations that the country is committed to peaceful uses of nuclear energy, such a development need not cause concern abroad. The nuclear fuel issue has now gained a symbolic significance far beyond its impact on the Indian nuclear energy programme and discord over fuel supply is bound to affect the whole gamut of Indo-U.S. relations. The way Washington--meaning by the term the combined, interacting personages, the President and members of the Congress--acts on the pending and future shipments will be a measure of its earnestness in improving relations with India.

CSO: 4220

WEST'S POLICY BLAMED FOR THIRD WORLD NUCLEAR PROGRAMS

Calcutta THE STATESMAN in English 30 Jul 80 p 8

[Editorial: "Spread of the Bomb"]

[Text] DEMANDS for an Indian nuclear weapons programme were revived in Parliament during the debate on grants for the Defence Ministry. It was perhaps not entirely coincidental that this was during the Pakistan Foreign Minister's visit to New Delhi; it was bound to be argued that the Pakistani bomb project had strengthened the case for nuclear weapons for India. The Prime Minister did not refer to this argument, but she could hardly ignore the Pakistani preparations. She refrained from spelling out what might be needed in response, let alone endorse the view that an immediate Indian bomb programme was the answer. But her recognition, in a formal statement, of the "serious implications of Pakistan acquiring nuclear capability" is likely to stimulate further debate on the subject. That should be entirely in order, even beneficial—but only if the discussion is rational and informed. On so sensitive and complex a subject, an emotional over-reaction would be particularly unhelpful.

Events and trends are, however, conspiring against calm preservation of India's stated policy. It can be argued, as many abroad have done, that this policy came to end with the Pokharan explosion. But even if the claim of a purely "peaceful nuclear explosion" is discounted, on the supposition that the main objective was to fabricate and test-explode a nuclear device that could be developed into an operational weapon, New Delhi's critics must concede that it has stopped short of such follow-up. Even those who harbour grave suspicions about India's nuclear intentions have not suggested that it has already undertaken a secret weapons programme. Pakistani leaders, on the other hand, publicly expressed a resolve to develop or acquire the bomb. Though Pakistan's projects for uranium enrichment and fuel reprocessing (to extract plutonium) are said to be for peaceful applications, the nature and state of its civil programme do not substantiate this view, while it can be convincingly shown that India needs plutonium and enriched uranium for its power programme. Besides, the way Pakistan has gone about these projects has left no one in doubt about its bomb-making intentions.

During his visit to New Delhi, Mr Agha Shahi denied that Pakistan was making nuclear weapons; but the remark that it was "very far away from manufacturing the bomb" might have referred more to technical problems to be solved than to any intention to forgo the option. At any rate, there is unmistakable evidence that Islamabad has given high priority to a bomb project. What needs now to be noted is that it is not only Pakistan which has done this. According to a U.S. military intelligence report, South Africa may have carried out a nuclear test last September, though initial speculation on these lines was subsequently discounted. Israel has long been widely believed to have produced and stockpiled nuclear weapons; and now Tel Aviv is concerned over reported Iraqi preparations. While the Israeli capability was built largely with American help (perhaps with official knowledge, if not complicity), France is said to be responsible for reported Iraqi progress towards the bomb.

President Husain of Iraq has of course denied that his Government has any plans to produce nuclear weapons; and the French have assumed an air of pained innocence at the suggestion that they have in any way helped the Iraqis in this direction. It has not been seriously suggested that Iraq is on the point of joining the nuclear club but there is some evidence to suggest that entry may not be delayed beyond 1985. Not surprisingly, there is much greater concern in the West over reports of Iraqi advance than there was over clear evidence of Israeli preparations. An Islamic bomb, whether manufactured in Pakistan or in Iraq, would certainly make the West Asian situation far more explosive; but basic responsibility must be borne by the Western Powers which encouraged, or connived at Israeli nuclear ambitions. The West should have also realized early enough that an Islamic bomb in Pakistan, financed by Islamabad's Arab friends in response to the Israeli challenge, would have grave strategic consequences for India as well.

CSO: 5100

INDIA TO SET UP SEVEN MORE HEAVY WATER PLANTS

Rangoon THE WORKING PEOPLE'S DAILY in English 20 Sep 80 p 6

[Text]

India has decided to set up seven more heavy water plants as part of its nuclear power programme, one of the programme's directors said in an interview published here today.

Dr N Srinivasan, who coordinates heavy water projects, told the *Statesman* newspaper that two of the proposed plants should be ready within seven years.

The two plants, with an annual production capacity of 70 tonnes each, will be built in the western states of Maharashtra and Gujarat.

Dr Srinivasan said the Government planned to start work on the other five plants during the current plan period (1980-85) and have them completed by 1990-92.

The seven plants will be in addition to five already existing or under installation which have a total annual production capacity of 114 tonnes.

The Soviet Union is to supply 250 tonnes of heavy water to India under an agreement signed in Moscow last February.

India plans to increase its nuclear power generation capacity to 2,740 megawatts in 1991-92 from 860 megawatts this year.

CSO: 5100

UNCERTAINTIES STAY ATOMIC POWER GROWTH

Calcutta THE STATESMAN in English 1 Aug 80 p 8

[Editorial]

[Text]

The Department of Atomic Energy is said to have drawn up a plan for the installation of nearly 10,000 MW of nuclear power during the next 20 years. Anyone familiar with the pace of development so far can only be amused by the boldness of such planning. The late Dr Vikram Sarabhai had drawn a "profile" of growth for the seventies. If the vision had been translated into reality, India would have had a total nuclear capacity of 2,700 MW by now. But what has been commissioned so far is only 640 MW: 420 MW at Tarapur and 220 MW at Kota in Rajasthan. Even if the second 220 MW unit of the Rajasthan station is commissioned this year, the total will be only 860 MW. The two other stations now under construction at Kalpakkam (Madras) and at Narora in Uttar Pradesh, will add 940 MW, raising the total to 1,800 MW. If the projected total of 10,150 MW is to be realized, new plants will have to create an additional capacity of 8,350 MW by the end of this century. It is remarkable that, given the record so far, India's atomic planners should think such a target attainable. They are apparently thinking of commissioning, in less than 20 years, 10 more heavy water reactors of 235 MW each, and 12 such reactors of 500 MW each. They also hope that, with luck, the first fast breeder reactor of 500 MW may also be operational in the mid-nineties. Too many things have gone wrong with the atomic energy programme for this grand vision to inspire the public.

The 1980-81 "performance budget" of the Department of Atomic Energy does not mention this 20-year plan, but it says that the total capacity is expected to be 2,740 MW in 1991-92 (approximately what Dr Sarabhai expected to be achieved by the end of 1979). The target should not be beyond reach; it entails no more than completing the projects under way and two new ones of the same size—each consisting of two 235 MW units. A decision has already been taken to build two new stations, though details have not been disclosed. According to the latest official estimates, the two units of the Madras plant should be commissioned in 1981 and 1984 and the two at Narora in 1985 and 1986. If work on two new stations starts reasonably soon, it should not be impossible to commission them by 1991-92; the gestation period should not exceed 10 years. But the record is not encouraging.

While the first unit in Rajasthan was completed in eight years, 13 years have already been spent on the second; the first unit at Kalpakkam will also have taken 13 years if it is completed on present schedule. The delays are often said to be due to unforeseen difficulties, but it should not have been difficult to foresee that commissioning of power reactors might be held up in the absence of an adequate domestic supply of heavy water. Plans for heavy water production have all been upset by a variety of technical and administrative problems compounded by some curious accidents. But it is not merely lack or shortage of certain special materials which has delayed nuclear power projects, nor does inadequacy of the industrial infrastructure in respect of nuclear construction complete the explanation. There has also been a decline in zeal, application and innovative enterprise, perhaps resulting primarily from policy uncertainties and weakness of central direction.

CSO: 5100

GOVERNMENT MOVES TOWARD LOCALIZATION OF NUCLEAR POWER PLANT FACILITIES

Seoul THE KOREA TIMES in English 2 Sep 80 p 7

[Text]

On the occasion of the investment realignment for heavy industry, the Ministry of Commerce and Industry will push for joint ventures and technical tieups with advanced foreign countries in a move to complete the localization of nuclear power plant facilities, heavy construction equipment and automobiles by [illegible].

According to the localization plan for major machinery drafted by the ministry, the localization rate for nuclear power facilities, currently at [illegible] percent, is to be raised to 100 percent by [illegible].

Informed sources said joint ventures or technical cooperation with Westinghouse Electric Corporation of the U.S., Framatome of France, KWU of West Germany, GEC of Britain and other companies would be accelerated.

In line with the realignment of the heavy industrial structure, power station facilities and construction heavy equipment projects were unified under [illegible] Heavy Industries.

Of the power generation facilities, the ministry said such secondary supplies as boilers, which had been primarily supplied by domestic firms, would be completely localized by [illegible].

Primary equipment such as reactors and turbine generators, which have been dependent on Westinghouse, GEC and Atomic Energy of Canada Ltd., will be localized by [illegible], the sources said.

The sources said the plan stipulated that the localization rate for such construction heavy equipment as bulldozers, loaders and mobile cranes would be raised to 100 percent by [illegible] from the present [illegible] percent.

Joint ventures between Hyundai Motor Co. and General Motors Corp. of the U.S. are planned to be encouraged for the production of passenger cars, while technical introduction into the Kia Industrial Co., which was designated as a plant specializing in producing large-sized vehicles, will also be pushed so that the localization rate for automobiles might be raised to 100 percent by [illegible].

The present localization rates remain at [illegible] percent for passenger cars, [illegible] percent for buses and [illegible] percent for trucks.

In addition, the ministry has decided to localize large-sized engines, ships and helicopters by [illegible]. Railroad locomotives will be completely localized by [illegible].

Localization Goal

(unit : percent)

	1979	'81	'86	'91
N power stations	23	50	70	100
Construction heavy equipment	60	80	100	—
Automobiles	85	95	100	—
Large-sized engines	60	70	100	—
Ships	60	80	100	—
Machine tools	70	100	—	—
Locomotives	30	60	80	100
Airplanes (helicopters)	40	60	100	—

[illegible]: 100

URANIUM EXPLORATION PUSHED

Seoul THE KOREA TIMES in English 30 Sep 80 p 7

[Text]

Under the government policy of tapping resources overseas, the nation's efforts to explore uranium will go into high gear next month.

The nation will begin its independent exploration for uranium in Sudan early next month.

And drilling at a uranium site in Gabon is expected to start next month also by a Korean engineering company.

A five-man Korean team of mining experts is scheduled to leave here early next month for Sudan to engage in uranium exploration, government sources said yesterday.

The team will be composed of two officials of the state-run Korea Mining Promotion Corporation and three from the Daewoo Industrial Co.

Joining them will be one mining expert from the Korea Research Institute for Geoscience and Mineral Resources. The expert will join them one month later, the sources said.

The sources said the Korean explorers would work for up to six months in an area some 400 kilometers southeast of Khartoum, capital city of Sudan.

The Daewoo Industrial Co. had won temporary permission from the Sudanese government to hunt for uranium there.

Meanwhile, the Hankook Kunup Engineering Ltd. will conduct uranium boring in Gabon for nine months beginning next month.

The planned drilling is in lieu of the state-run Korea Electric Co. (KECO), which is seeking to find a sizable amount of uranium in Gabon in a joint venture with Cogema of France and the Gabonese government.

Hankook Kunup won a contract to conduct drilling for uranium in the African country early this year.

KECO, the nation's only electric utility firm, is also engaged in exploration for uranium in Paraguay to consume it for its Kori Nuclear Power Plant and other projected atomic power stations now under construction.

Development of a uranium mine in Canada is planned in partnership by KECO and Daewoo.

A stable supply of uranium is necessary for the resource-poor nation, which is all out to find alternative energy sources.

CSO: 5100

THAILAND

BRIEFS

URANIUM PELLET PRODUCTION--The nuclear technology department of Chulalongkon University is conducting experiments to transform uranium found in Thailand into nuclear energy by 1982 to mark the bicentennial anniversary of the founding of Bangkok, Prof Suwan Saengphet told the NATION yesterday [27 September]. Dr Suwan, head of the department, said that the department has discovered a method for extracting uranium from tin ore through a mineralogical process to the effect that the "depleted uranyl nitrate" is obtained for use with a nuclear reactor of the heavy water moderator type. He revealed that tin ore found in various provinces including Ratchaburi, Kanchanaturi, Phetchaburi, Phichit, Kampaengphet yields 2-4 percent of uranium compared with only 0.02 percent contained in tin ore in Phuwiang district, Khon Kaen. Dr Suwan said that the fuel produced by the department, called uranium oxyle pellet, is in cylindrical shape--the size of which is one centimetre in diametre and one centimetre in height. [Text] [Bangkok NATION REVIEW in Enblish 28 Sep 80 p 1 BK]

CSO: 5100

INTERNATIONAL AFFAIRS

BRIEFS

CEMA NUCLEAR SESSION--Warsaw, 1 Oct (PAP)--The 3rd session of the Intergovernmental Commission for Coordination of Cooperation of the CMEA countries and Yugoslavia has opened in Warsaw. The session is devoted to the implementation of the agreement on multilateral international specialization, coproduction and mutual deliveries of equipment for nuclear power plants in the years (?1980-90) signed on June 28, 1979. Taking part are delegations of Bulgaria, Hungary, the GDR, the USSR, Czechoslovakia, Poland and Yugoslavia as well as representatives of the CMEA Secretariat and the international Interatomenergo economic organization. The commission will evaluate progress in the distribution and coordination of production in the CMEA countries of nuclear power equipment blueprints, based on Soviet Technology. [Text] [LD011452 Warsaw PAP in English 1400 GMT 1 Oct 80]

CSO: 5100

DEVELOPMENT AND PROBLEMS IN PRIBRAM URANIUM MINES DISCUSSED

Prague RUDY in Czech No 7, 1970 pp 187-194

[Article by Engrs Vasil Pjescak and Juraj Stenczel: "Production Development and Problems at Pribram Uranium Deposit"]

[Text] There is a long and famous tradition of mining at Pribram in the history of the Czechoslovak mining industry. According to contemporary documents, mining was being conducted in this area as early as the 13th century [1]. Up to 1945 Pribram was noted for the mining of nonferrous metals: silver, lead and zinc.

After 1945, when there occurred increased mining of ores containing radium and other radioactive elements, attention was also focused on the Pribram area.

Studies indicated that Pribram, at one time a famous source of silver-bearing ore, was at the threshold of a new period of mining development. Development of mining production at Pribram and its rapid growth required the establishment of independent Mining Inspectorate No 7, as an affiliate of the Jachymov Mines National Enterprise in Jachymov. The date 1 June 1949, when this independent organizational unit was established, marks the beginning of our enterprise's existence. Mining production at this mineral deposit dates from 1950.

1. Geological Description of the Mineral Deposit and Operating Conditions for Production

The Pribram mineral deposit is a typical representative of a hydrothermal deposit of the vein type and is developed in Central Bohemian pluton exocontact. Commercially-minable ore structures are situated primarily in sedimentary rocks of the post-spilite stage of the Algonkian and to a lesser degree run to the Central Bohemian pluton as well. The entire sedimentary complex is a component of the basic structure of the entire deposit -- the Pribram anticline [2].

All ore veins are essentially mineralized fracture lines, for the most part formed by carbonates, especially calcite and manganocalcite. The configuration of the veins is dependent on that of the joints. The majority of veins are steeply inclined, from 70 to 85°. Vein thickness ranges from several centimeters to several meters. Uranium mineralization in the veins is not connected and occurs only in certain areas where ore bodies are formed, which actually constitute that portion of the veins which is suitable for ore extraction. They are formed by the grouping of ore accumulations -- lenses -- of complex configuration, mutually separated by oreless intervals. We characterize the ore bodies in general as flat formations in the plane of the veins, with complex structure and configuration. Their contacts with non-metalliferous portions of the veins are uneven, rarely sharp. Because the thickness of the ore bodies is insignificant in comparison with the other two dimensions, area is practically the sole criterion of estimating ore presence. Distribution of lenses proper within ore bodies is highly variable both in configuration, size and thickness.

Nonuniformity of mineralization is characterized by the coefficient of ore content and is expressed in the ratio of lens surface to total ore body surface.

The attendant rocks, as a consequence of the hydrothermal process, are altered to a distance of from 0.2 to 2.0 meters from the veins. This distance depends on tectonic disturbance of the rocks, and less on vein thickness. From a mining operations standpoint this means that in ore extraction one must figure on reduced strength of these rocks.

2. Production Operations on the Mineral Deposit

The principal mining method employed on this ore body is cut-and-fill stoping, which is performed in various modifications together with stope-drift mining (selective method).

The selective mining method with logging is employed in the margin areas of the deposit, or in sections of veins where mineralization occurs in the vicinity of the lower limit of extractability or where blocks run to an end. Table 1 contains, on the basis of available measurement data, the percentage share of ore body mining methods during the period running from 1 January 1956 to 31 December 1962 according to the "old" division.

In the course of mining the ore body, the above mining methods were subjected to analysis from a mining-geological, industrial safety and economic standpoint.

Development of mining operations in the period 1950-1958 was characterized by rapid growth of production from this mineral deposit, with the aim of extracting a maximum quantity of metal.

After 1958 there occurred stabilization of production, with greater emphasis placed on questions pertaining to efficient management and reducing

Table 1. Relative Percentage Shares of Full-Section Excavation Methods, 1956-1962

1 Rok	2 Zásobníková metoda	3 Výstupková metoda			
		4 s prodlouženými sypy	se škrabákovou dopravou ke komínům 5	6 s ruční dopravou ke komínům	7 celkem
1956		50.9		49.1	100.0
1957		60.7		39.3	100.0
1958	5.4	61.6	9.9	21.1	94.6
1959	3.1	53.8	20.1	23.0	96.9
1960	3.5	55.3	21.9	19.3	96.5
1961	60.9	25.2	11.1	2.6	39.1
1962	78.4	11.8	8.0	1.8	21.6
Celkem (7)	5.7	10.2	2.2	4.8	17.2

Key:

1. Year
2. Back-stoping method
3. Stoping method
4. With extended ore passes
5. With scraper transport to skip shafts
6. With manual transport to skip shafts
7. Total

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costs of mining and processing. These objectives resulted in particular in a change in ore mining techniques, in increasing the percentage share of mechanization and increased labor productivity, together with material incentive and reward for workers employed in mining operations. Table 2 shows evolution in the percentage share of mining methods with so-called full-section excavation in the period 1963-1978.

Table 3 shows evolution of shift labor productivity per worker (m^2) and shift earnings with methods involving so-called full-section excavation.

Following complex development, the "Mining Production Methods" for the mining area operated by Pribram Uranium Mines, went into effect on 1 January 1978. This list contains mining production methods which are appropriate for this mineral deposit. These methods have been elaborated in order to make possible efficient and full extraction of mineralized veins while maintaining conditions of maximum industrial safety, health and sophistication of mining techniques [5].

3. Brief Description of Employed Mining Methods

3.1. Cut-and-Fill Stoping

The requirement of minimal loss and minimal contamination of the ore in a complex geological situation leads us to employ mining extraction methods

Table 2. Relative Percentage Shares of Methods With So-Called Full-Section Excavation, 1963-1978

1 Rok	2 A-metoda ruční 3	 mechanizace 4	 5 z toho bezztrátová	6 celkem	7 Bezztrátové dobývání	B-metoda	C-metoda	8 E-metoda výseková	6 Celkem
1963	1.0	23.3		24.3		65.7	10.0		100.0
1964	2.4	41.1		43.5		53.4	2.1	1.0	100.0
1965	0.2	36.1		36.3		52.6	0.5	10.6	100.0
1966	0.5	32.6		33.1		51.6	0.1	15.2	100.0
1967		34.5		34.5		47.2		18.3	100.0
1968		46.2	4.8	46.2		44.2		9.6	100.0
1969		54.6	4.5	54.6		39.7		5.7	100.0
1970		59.0	1.3	59.0		41.0			100.0
1971		66.5	3.6	66.5		33.5			100.0
1972		68.6	5.4	68.6		31.4			100.0
1973		78.0	11.6	78.0		22.0			100.0
1974		87.5	22.1	87.5		12.5			100.0
1975		61.7		61.7	31.5	6.8			100.0
1976		70.0		70.0	27.9	2.1			100.0
1977		64.4		64.4	34.3	1.3			100.0
1978		63.0		63.0	37.0				100.0
Celkem(6)	0.2	42.4	5.1	42.6	5.2	25.5	0.7	3.1	100.0

Key:

1.	Year	5.	Of that, without loss
2.	A-method	6.	Total
3.	Manual	7.	Without loss extraction
4.	Mechanization	8.	E-method, cut-out

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involving filling in mined area with waste rock obtained in the stoping process.

A shift was made from the older selective mining with ore and gangue sorting at the work site to methods involving so-called full-section excavation, whereby the entire vein area of a block is excavated. This mining technique was made possible by an improved process of ore dressing, which made it possible to separate even little-contrast ores.

3.11. Preparation Work for Full-Section Excavation

Preparation of a block for full-section excavation consists of driving a drift above a lower drift between two adjoining skip shafts. The thickness of a supporting pillar ranges between four and six meters. In cases of weak rock or a unit with greater mineralization, a block will be laid out with artificial roof construction.

Table 3. Development of Labor Productivity With Methods Employing So-Called Full-Section Excavation (m^3 per shift) and shift earnings (Korunas)

Rok 1	2 Produktivita práce		5 Směnový výdělek PV	
	absolutně 3	% k r. 1960 4	Kčs absolutně 6	%
1958	1,331	78,7	150,67	87,36
1959	1,482	87,6	156,36	91,82
1960	1,692	100,0	172,47	100,0
1961	1,991	117,7	141,53	82,1
1962	2,116	125,1	133,04	77,1
1963	2,087	123,4	126,28	73,2
1964	1,842	108,9	121,93	70,7
1965	1,969	116,4	135,30	78,4
1966	2,032	120,1	155,86	90,4
1967	2,081	123,0	157,74	91,5
1968	2,174	128,5	185,41	107,5
1969	2,002	118,3	210,86	122,3
1970	1,920	113,5	199,30	115,6
1971	1,931	114,1	209,40	121,4
1972	1,958	115,7	213,92	124,0
1973	2,019	119,3	217,28	126,0
1974	2,119	125,2	219,76	127,4
1975	1,974	116,7	216,96	125,8
1976	1,815	107,3	219,28	127,1
1977	1,890	111,8	240,40	139,4
1978	1,910	112,9	250,40	145,2

Key:

1. Year
2. Labor productivity
3. Absolute
4. Percentage of 1960
5. Shift earnings
6. Korunas, absolute

In the past block dimensions were exclusively 50 x 50 meters; later, with the advance of mechanization in mining, block dimensions increased to as much as 100 meters.

From the very beginning stoping methods were divided into methods A, B, and C, on the basis of how broken ore material was transported away from the stope.

3.12. Method A

Method A, later called the "old" method, was employed from the beginning of operations at the Jachymov mines. The mining operation does not employ auxiliary ore passes, employs two end skip shafts and, in an alternative layout, could also have a middle skip shaft (Figure 1).

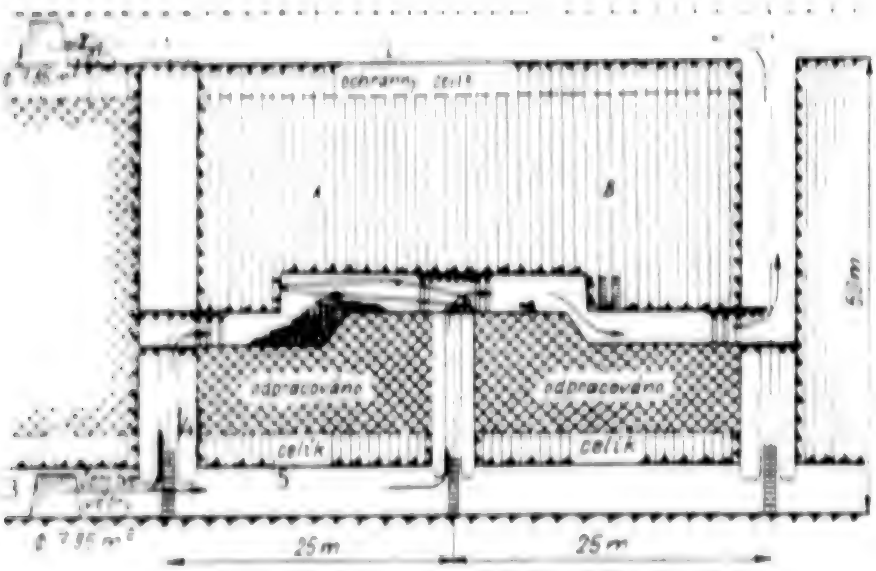

Figure 1. Mining by Method A.

Key:

1. Safety undisturbed rock
2. Spent air
3. Fresh air
4. Filled
5. Undisturbed rock

The individual stopes run from the middle of the stope block to the edge skip shafts. At first EDK 60 drills were exclusively used in stoping, while Soviet inclined drills appeared in 1953, and finally there appeared in 1960 series VK 21 drills, which totally replaced the EDK 60 drills. The goal in improving labor productivity and process sophistication, however, was not yet fully achieved.

Major advances were not achieved until mechanization of ore removal, for this method involved a considerable volume of manually moved ore. Scrapers and wassing devices were used in moving ore from the stope. With the old method, with a short distance from the ore passes, the broken ore was simply transferred by shovel, while with greater distances wheelbarrows were employed. Mechanization of ore removal was ultimately introduced, and a mechanical shovel began to be employed; a major improvement was achieved, however, by the employment of scraper winches. The earliest was the SPL-4 type 2 (Soviet-made), in 1958, and subsequently the Czech-made VSS - 206 winch, which made it possible to boost labor productivity and increase average advances (Figure 2). Also significant was the adoption of high-output type LU-15, and later SV-20, electric scraper winches, which, however, required specific conditions for utilization. Figure 3 contains a time graph of the stoping work cycle employing a scraper winch of Soviet manufacture. Figure 4 contains a stoping plan employing mechanical removal of broken ore, with the aid of a type SV-20 scraper winch [6].

Figure 2. Drawing Broken Ore on a Stope With a Scraper (photo by Zdenek Sedivy)

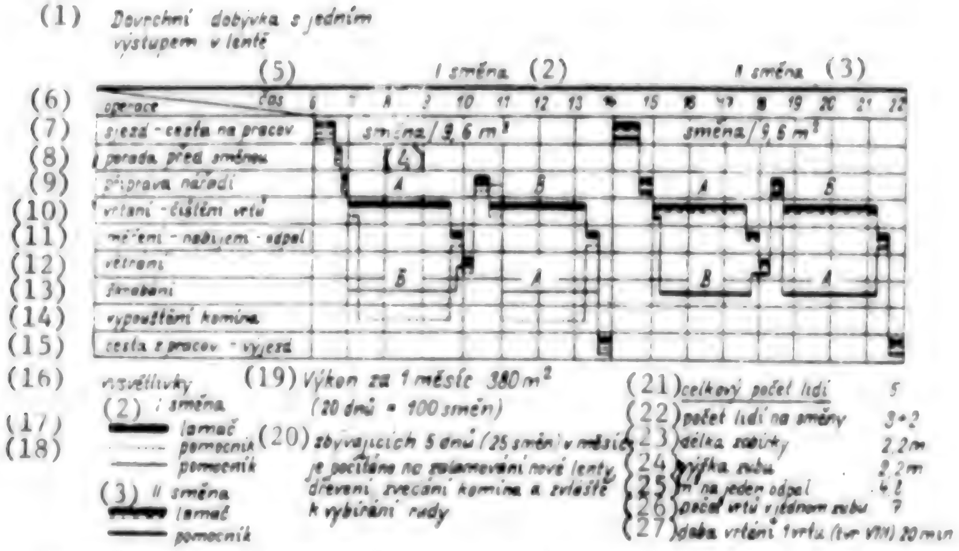

Figure 3. Time Graph of Stoping Labor Cycle With Mechanical Ore Removal

Key to Figure 7 on preceding page:

1. Inclined stope with one ledge
2. First shift
3. Second shift
4. Shift
5. Time
6. Operation
7. Descent, proceed to work site
8. Conference before shift starts
9. Preparation of tools
10. Drilling-cleaning boreholes
11. Measuring-loading-firing
12. Airing out
13. Scraping
14. Skip running
15. Proceed from work site, ascent
16. Legend
17. Drill operator
18. Helper
19. Output per month 380 m^2 (20 days=100 shifts)
20. The remaining five days (25 shifts) in the month are figured for driving new runs, timbering, skip hoisting, and particularly for ore removal
21. Total number of men
22. Number of men per shift
23. Face length
24. Tooth height
25. Square meters per shot
26. Number of boreholes per tooth
27. Time to drill one hole

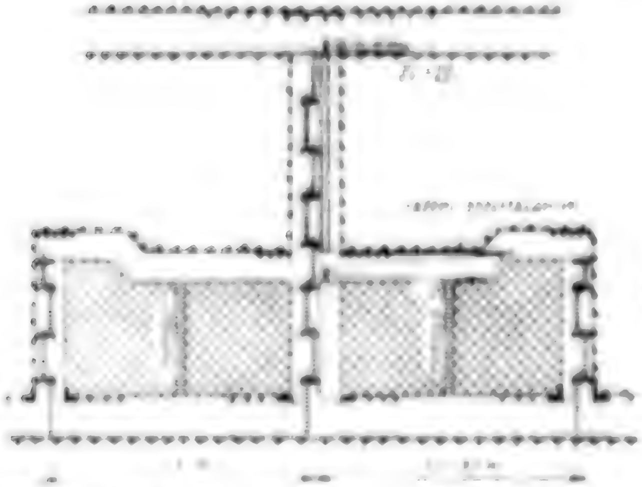

Figure 8. Diagram of Stope With Central Skip Shaft and Ore Removal with an Electric Scraper Winch

Characteristic of method A is a small volume of preparatory work in comparison with subsequent modifications of stope mining; the "old method" with manual transport to skip shafts came to a definitive end in 1966, while its percentage share was very small from 1961 on.

Method A is satisfactory from the standpoint of job safety, and chambers are ventilated by a through air stream.

4.13. Method B. So-Called "Storage Method"

This method is in actuality the back stoping method, with waste rock put down in place of ore.

This method was employed on steep veins, at an angle of more than 60°, with strong wall rock. Fill, obtained from waste rock portions of the block, was not to be inclined at an angle to the settling and had to guarantee that it would "run" up to completion of the block. Preparatory work differs from the preceding methods as follows: auxiliary ore passes spaced at five to six meters are placed in the bedrock above the drift. The spacing would be established (taking into account mining-geologic conditions) by the enterprise chief engineer. In addition to auxiliary passes, there would be ore passes which would rise as the block advanced. Their construction would be of wood and sheet-metal ventilation pipe, and subsequently of reinforced concrete formwork or prefab elements. The ore would be brought to the ore passes by wheelbarrow, and later by winch-drawn containers. Recommended flooring in the stope consisted of long rubber strips, which also served as protection to prevent the sudden chance falling of the breaker into the fill.

This method of necessity presupposes a great deal of blasting work, which was made possible by high-productivity drilling equipment, that is, inclined hammer drills of Soviet manufacture, PT 30, PT 33, PT 45, and subsequently PT 29 and PT 36, which are still employed in a modernized version (Figure 5). We should note that the number of injuries during blasting operations declined sharply beginning in 1958, when fuse detonation was prohibited.

Figure 5. Stoping with Inclined Hammer Drill (photograph by K. Pactal

Method B at [illegible] produced substantial average [illegible] and [illegible] results. This advanced technique experienced its greatest expansion in the period 1961-1966 and contributed to productivity growth in stope mining operations (Table 3). After 1966 the percentage share of this method steadily declined in connection with a rapid decrease in suitable conditions for employing this method. This method has not been employed on this mineral deposit since 1978.

A block would be stoped most frequently by drilling vertical boreholes at a spacing of from one to two meters, less with the aid of steps drilled with horizontal boreholes. Work on blocks with Method B was demanding as regards management and supervision (danger of forming vaults in the fill), and therefore a special set of work safety regulations was drawn up for this method.

Advantages of this method include in particular the elimination of transport within the block (horizontal) and high labor productivity. Drawbacks include the possibility of forming vaults, and therefore increased danger for the drilling crew. This method also requires a considerable volume of preparatory work.

5.14. Method C -- Modification of Stope Mining with Extended Auxiliary Passes

This method was intended for veins pitching from 45 to 60°, where the overlying or underlying rock is rather weak and where veins frequently change direction, for which reason scraper transport cannot be employed within the block. Preparatory work differs from the preceding method as follows: auxiliary passes spaced at approximately 10-15 meters from one another are placed in the above-drift bedrock or in an artificial roof; these passes are raised as mining advances. The auxiliary passes were for the most part of a wooden framework construction.

This method was widely employed on this ore body in the 1950's. It began to decline beginning in 1961, and was no longer employed in its conventional form from 1967 on. Extension of auxiliary passes required considerable labor, especially at the beginning, when manual preparation of wooden framework lining elements under the stope was performed, and subsequently vertical transport to the stope and timbering proper of the passes. A simple decrease in ore transport distance failed to lead to the anticipated increase in labor productivity, while on the other hand labor requirements and direct production outlays increased. For these reasons Method C also ceased to prove effective. The advantages of this method include good application especially in working veins with variable position parameters, or complex veins, such as crossing or paired veins, for example. Another advantage is the short distance of horizontal ore transport in the stope.

[illegible]

[illegible] work it is necessary to [illegible] lateral levels along the vein at a sufficient distance from one another where the undisturbed rock can be successfully prospected with logging holes. Considering the state of development of logging equipment, this spacing ranged between five and six meters.

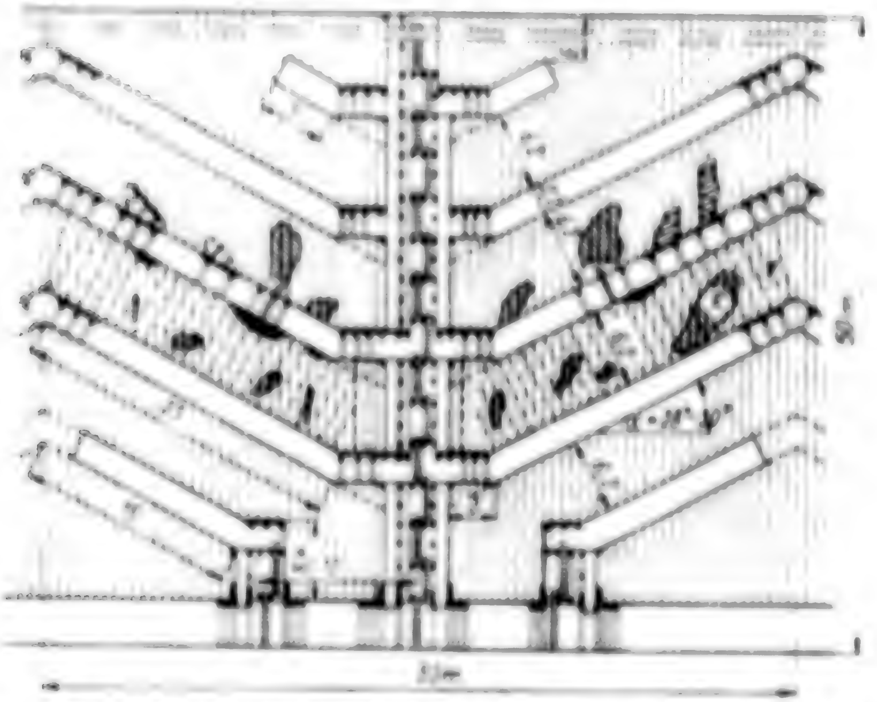

Figure 6. Selective Mining Method, So-Called Inclined Working

These methods are intended for veins where the geologic situation is simple, where mineralization is nonuniform, and the overall mineralized area is formed by a relatively small number of ore lenses of smaller area. The basic idea behind this method proceeds from the endeavor to remove only mineralized (active) portions of the vein with the most essential timbering of the excavated space, leaving the waste rock undisturbed. The selective method of mining the vein area of a block is therefore highly efficient, and high labor productivity is achieved.

Over the years several versions of stope-drift mining have been employed. The first version of this method at Pribram was distinguished by the fact that the sublevels were driven against one another from above from the two end skip shafts (a 50 x 50 m block).

On a layout from 1959 (Figure 6), we see an interesting arrangement, so-called "inclined working," which partially utilized gravity fall of material down special chutes made of cut-open ventilation ducting.

[illegible] inclined workings with an angle of 90° (safety regulations permit[illegible]), [illegible] [illegible] the disintegrated ore remained in the stopes and [illegible] [illegible] frequently [illegible] up with water.

This mining technique was soon abandoned because of the difficult working conditions and problems with ventilation.

A significant change in this mining method was introduced by mechanized removal of disintegrated ore from the stope-drifts with the aid of scraper winches. Central skipshafts began to be incorporated, from which stope-drifts are driven in both directions simultaneously, average advances increased and per-worker labor productivity rose.

After each pair of stope-drifts has been driven, logging boreholes were drilled into the undisturbed rock between levels on the basis of instructions from the geological service. New ore is broken upon establishing the presence of through air current ventilation.

Table 4 shows the percentage share of the selective method as a second [illegible] method.

Table 4. Percentage Share of Selective Method in Total Mining Operations, 1956-1979

Year[1]	SM[2] (%)	Year	SM (%)
1956	[illegible]	1968	22.6
1957	16.1	1969	19.9
1958	[illegible]	1970	17.4
1959	[illegible]	1971	20.8
1960	[illegible]	1972	[illegible]
1961	11.2	1973	20.1
1962	19.2	1974	22.6
1963	[illegible]	1975	25.6
1964	11.5	1976	24.9
1965	19.7	1977	23.9
1966	17.2	1979	24.9
1967	22.6		

Notes:
1. Year
2. Selective method

This [illegible] contains, with the percentage shares of full-section excavation [illegible], also the so-called "cut-out method," as one of the stope-drift mining variants. Work advanced upward with this method and, in case of a marked change in the character of mineralization, was supposed to make it possible to shift to block full-section excavation. This technique was employed in the years 1964-1969.

[illegible] Analysis of Mining Methods

[illegible] Mining Shallow-Dipping Veins

[illegible] have occurred and locally continue to occur between veins in the [illegible] deposit vein structures with a pitch of approximately 10 to 15°. In these instances currently employed stope mining methods are unsatisfactory and must be altered. In the 1960's mining engineers proceeded to solve this problem and, choosing from several alternatives (authors — engineers [illegible] and J. [illegible]) the directional driving method was selected, with mechanical ore removal and filling of the mined space.

Dipping veins the unlined length of which runs 100–120 meters, are mined in an upward direction, hence the requirement of sequential filling of the mined space. With the described mining method, the best results were achieved by employing blasting sectors, with the aid of which free spaces are filled with waste rock.

In employing this method the mineralized gangue was exposed in almost all instances, and either in the overlying or underlying rock. The overlying rock is oriented more or less the same as the vein and has a strong tendency toward bench separation, especially in the immediately overlying rock. The working cavity therefore required sequential provision of high-quality timbering (Figure 7, on cover) [figure omitted]. This method ensured the anticipated increase in labor productivity and decrease in volume of preparatory work and acceptable costs.

Waste rock would be transported away along the pillar to an inclined drift by remote-controlled SV-20 scraper winches to a bottom-level drift. Rock transport through the inclined drift was provided by scrapers, and sometimes by a chute system. Ore was transported in containers.

5.2. Sublevel Mining by Sinking a Shaft Along the Vein

A significant problem at this deposit, particularly following 1965, was economical mineral extraction in smaller and separated areas situated below existing operating levels. Mining of this ore with the aid of a new, lower level would be quite uneconomical and therefore was not considered. That ore which extended at least 20–25 meters below an operating level was mined by the method of so-called shaft sinking along the vein. Experience with this mining technique had been obtained at J.D. National Enterprise, [illegible], and a standardized layout, approved by the District Mining Office in [illegible], was applied, following modification to fit our conditions, in a test operation in Shaft No 29.

We began with small profiles (4.16 m²) and with hoist equipment consisting of [illegible] and [illegible] winches; skip capacity was only 0.03 m³ (during shaft-sinking the skip travels to the bottom, where it is loaded manually). When driving stope-drifts and during mining operations proper, the skip descends below the stope-drift level and is filled from a storage receptacle (Figure 8). Work proceeded slowly, particularly at the stage of removal of disintegrated rock from the shaft bottom. Subsequently boring profiles were increased to 5.7 m^2; more powerful winches were employed, such as the VTS-118, and skip volume was increased to 0.3 m^3. The shaft profile has now been established at 4.9 m^2. One of the variant solutions made it possible to conduct mining-preparatory operations under existing operating levels with the aid of downward inclining drifts, which as a rule are driven into the vein-underlying rock. Downward inclining drifts with a profile of 6.6 m^2 can be worked with scraper winches, while with a steeper pitch they can be equipped with a rail-mounted skip controlled from both directions.

Figure 8. Filling a Skip with Sublevel Mining (photo by R. Klimova)

Mining procedures are the same for the above variants, and the general regulations applying to stoping apply. The cost of mining ore under existing operating levels is high, and therefore this method should be selected only in justified instances, within economically acceptable limits.

[illegible] Mining ore-containing fill

At this ore deposit we mine fill in blocks which had previously been mined by [illegible] excavation. This important supplementary activity obtains metal which was lost during primary mining and which is present in the fill in sufficient quantity that remining is economically effective.

The fill drop technique in particular has been and is being employed on this ore body, whereby fill [illegible] gravity fall is employed on veins with a pitch of 60° and more.

When independent flow of fill ceases, special [illegible] blasting is employed.

Dropping of fill from primary-mined blocks is allowable along individual [illegible] of vein systems from the edge of the mined space, that is, from the [illegible] mined veins, toward a crosscut in a horizontal direction and by [illegible] levels downward in a vertical direction.

A fill drop plan must be approved by the District Mining Office.

During fill drop remining it is necessary to maintain accurate records on mining fill from individual drop sites and stopes. Mining crews work on a piece-rate basis and are work-credited for extracted volume of fill.

At the present time, for example, Mine No 1 has achieved a long-term figure of [illegible] m^3 output per worker per shift on remining fill with the aid of [illegible] loaders.

Mining ore-containing fill is an important activity, and its percentage share will be considerable at this ore deposit in future years.

[illegible] Problem of Metal Loss During Mining Operations

Reduction of primary losses to a minimum is a basic requirement when mining valuable vein-type deposits, such as ours. Metal losses result in a substantial decrease in metal recovery and worsen overall economic performance.

The objective of mining operations is to achieve the greatest possible utilization of proved ore reserves which have been designated for mining. A certain percentage of metal losses is caused by technical deficiencies in the employed mining methods (so-called direct losses) and cannot be eliminated. Additional, so-called indirect, qualitative losses are caused by faulty mining techniques and are due particularly to the fact that:

a) finely-crushed high-grade ore ends up in the fill as a consequence of gaps in the flooring and cracks in irregularities in the stope floor [illegible] during the ore breaking operation;

b) small ore particles get into the fill, which are freed from the gangue during blasting operations on and in the immediate vicinity of stopes;

c) ore transport within a block is deficient, without special containers and in the ore passes through which it is transported to the bottom level;

d) a full ore pass will go out of service prematurely in the case of inappropriately selected pass designs or poorly-operated passes.

In 1966 our enterprise was ordered to come up with flooring which would totally eliminate ore losses in fill. Flooring employed up to present time does not prevent finely-broken ore from getting into the fill. Remining of this ore at positive test locations is a highly complex operation, because metal is quite extensively scattered throughout the fill.

An analysis we conducted indicated that the best solution to prevent undesirable losses is to prepare flooring of concrete directly on the fill.

This new process was tested in Mine No 111. Flooring was laid with pumite, and this method was given the name "lossless mining." The new flooring design proved fully effective, and the method produced the anticipated results.

The full-section excavation method first appeared in 1968 and since then has come into steadily increasing use (Table 2). When employing this technique (Method A) it is necessary to select blocks which are geologically and technically suitable (productivity, mineralization of ore body areas, strength of wall rock, etc). Correct mining operations proceed as follows: the ore is shot (broken off) onto prepared flooring and then is mechanically transported to the ore passes. After the concrete flooring is thoroughly cleaned of all bits of mined ore, the miners proceed with ripping wall rock to the width of the stope. Cleanness of the fill is verified prior to preparing additional flooring on the leveled fill floor. Locations where metal losses have occurred are immediately remined, with maximum depth of advance limited by bottom permanent flooring.

On the basis of distribution of occurrence of mineralization in a block, concrete flooring is prepared either along the entire length or only in the mineralized section, with extension to the ore pass. Distance of individual sections of concrete flooring from one another is determined by technical capabilities of testing fill within the restricted working space.

Concrete flooring permits by its design direct ore removal and will continue to be employed in selected blocks [2]. Simultaneously with development of this mining technique, new forms of constructing portable mine floorings are being sought, with employment of nontraditional materials, such as plastic liners.

6. Conclusion

Added to the existing complex geologic conditions prevailing at the Pribram deposit, as mining operations reach depths of more than 1,000 meters, are additional adverse phenomena such as abnormal behavior of the rock mass, particularly its increased vibration activity, increasing temperatures, etc.

It will therefore be necessary to continue addressing in an intensive manner particularly mine vibrations, timbering of mine workings, control of rock overlying certain vein structures, work site climate control, and proper mining methods in response to the surrounding rock mass, plus additional problems related to mining this ore deposit at great depths.

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8012
CSO: 5100

CNEA ASSUMES MANAGEMENT OF EMBALSE NUCLEAR PLANT

Buenos Aires CONVICCION in Spanish 2 Sep 80 p 10

[Text] Delays in the assembly of the Embalse Rio III power plant's nuclear sector, in Cordoba, have forced the National Atomic Energy Commission (CNEA) to fully assume the role of principal contractor, replacing a Canadian company, in order to insure work continuity.

CNEA President Vice Admiral Carlos Castro Madero announced yesterday afternoon at a press conference that an agreement was signed last Friday with Atomic Energy of Canada Ltd. (AECL), which was responsible for the assembly of the Rio III power plant's nuclear sector, that "will allow setting that plant into operation within the established time frame."

He explained that the AECL transferred to the CNEA the subcontracts which had already been signed with several local firms for the main work of that nuclear power plant--the third to be built in Argentina--but he repeatedly denied that the agreement was a "last resort measure" to avoid paralysis of the work initiated late in 1976.

The contract, signed by Castro Madero and AECL President James Donelly, who returned yesterday to his country after a 1-week visit to Argentina, is the result of negotiations started last April when the Canadian Government-owned company demanded a reevaluation of the 1976 estimated costs to carry out the work.

"We cannot speak of a Canadian failure," said Castro Madero answering a question, but he explained that "when they (the Canadians) agreed to build the plant they did not foresee the inflation in Argentina, and neither were they able to deal with the problem which was translated into higher costs."

He admitted, however, that "there were delays" in the building of the plant which, "in a certain way, led us to fully assume the role of principal contractor which we had already been partially playing" so that "in this way, we can be sure that the Embalse Rio III power plant will start operating approximately at the end of 1982."

Castro Madero denied "political pressures" from Canada and, faced with the reporters' insistence on knowing whether the CNEA had signed the agreement transferring the contracts as a last resort to avoid paralysis of the work, he answered that "it was not a desperate measure, on the contrary, it was a well-thought-out action which benefits us.

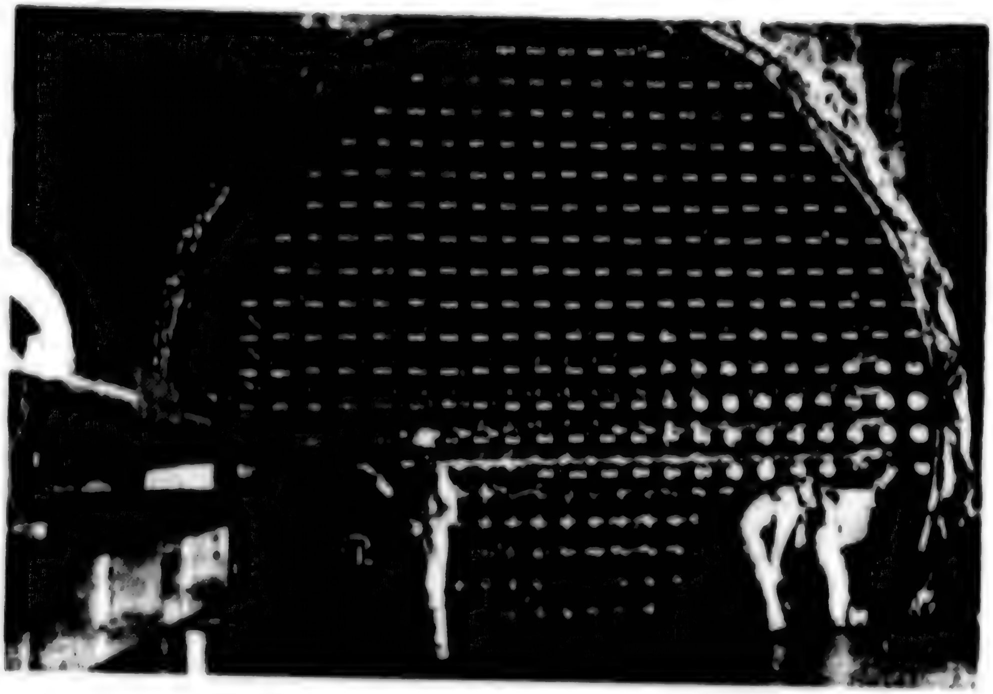
"The CNEA will be able in this way (by assuming total control of the assembly of that plant's nuclear sector) to demonstrate the extent of its capabilities in the nuclear field," Castro Madero maintained, even though he warned that the guarantees and safeguards about the "total operation" of that plant "logically fall on Canadian hands."

After announcing that by next 10 October "we will have specified the exact date" for setting into operation the Embalse Rio III nuclear power plant, Castro Madero revealed that the day before yesterday the top of the heavy ion accelerator tank was put into place at the Centro Atomico Constituyentes in this capital.

That accelerator, which has the largest pressure vessel ever built in Argentina, will be used in basic research tasks in nuclear physics, though it can also serve as a tool for other studies, such as, for example, analyses of the damage produced by radiation in different materials used in the construction of atomic plants.

Shortly before noon Castro Madero had gone to the Government House to inform the country's president about the outcome of his conversations with the Canadian company representative and its importance in the progress of the Embalse Rio III power plant construction work.

During his interview with Videla, the head of the CNEA also told him about the prospects for future Argentine-Canadian cooperation in the nuclear field and about different aspects of the forthcoming IEO general conference to be held in Vienna, and which Castro Madero will attend as governor and ambassador to that organization.



Assembly tasks in the calandria of the Embalse power plant CANDU reactor. CNEA technicians were in charge of the local assembly, a decisive step in acquiring experience. This objective was established by the CNEA decision announced yesterday.

9341
CSO: 5100

AMENDMENTS PLANNED FOR LAW ON NUCLEAR ENERGY

Frankfurt/Main FRANKFURTER ALLGEMEINE in German 5 Sep 80 p 14

[Article: "Limit on Liability for Nuclear Damages To Be Eliminated. Bonn Considering Amendment to Nuclear Energy Law. Hartkopf: Environmental Policy Must Not Stop At the Border"]

[Text] If the present government coalition should continue to exist following the Bundestag election, the government will propose in the Bundestag a change to the nuclear energy law in the form of a "liability amendment." This has now been announced by Guenter Hartkopf, undersecretary in the Ministry of the Interior, in Bonn before the Working Group for Environmental Questions. The Ministry of the Interior wants to increase the people's financial protection in the event of possible nuclear damages. The primary goal is to eliminate the "amount-based" liability limit. Furthermore, an amendment to the nuclear energy law is being planned with the goals that nuclear power plants be designed in a manner that makes them "easier to shut down," that state supervision be strengthened and that the elements involved in licensing be reviewed.

The Ministry of the Interior also intends to push for an expanded second amendment to the waste removal law, an amendment that failed in the last Bundestag. The two main aims are less waste of packaging and channeling wastes into economically efficient recovery of energy and raw materials. Hartkopf says that possibilities for utilization must become mandatory in respect to waste removal.

Hartkopf demanded supplements to the Federal Government's energy program which offer more consideration of environmental protection and the careful treatment of raw materials. The appropriate environmentally related prerequisites must be created for the gasification and liquefaction of coal. Precautions are necessary for heat pumps which could damage ground water. Crude oil should find optimal use in products beneficial to the environment.

Hartkopf sees the fight against cancer as being a key issue in the environmental policy of the 1980's. An entire program must be developed for this. Precise maximum values are necessary in order to control the dangers of certain carcinogenic substances. However, for the most part, we still do not have the scientific bases for determining maximum values.

In addition, Hartkopf told the Working Group for Environmental Questions that internationally coordinated environmental planning and policy is becoming increasingly more urgent. In harmony with all groups involved in environmental policy, the Federal government considers similar environmental protection obligations which extend beyond borders to be imperative so that citizens in neighboring countries are assured of the same protection and competitive distortions can be avoided.

Hartkopf considers the following to be the most important components of environmental policy that ranges across borders: uniform principles in planning power plants located near borders, guidelines for the EC to further decrease waste gases and noise from vehicles, joint minimum requirements in the EC in respect to an environmentally oriented review of public and private projects (environmental compatability checking), and improvement in protecting bodies of water. Agreements within international organizations and bilateral national agreements will improve citizen awareness, cooperation among the authorities and the right of those affected to hearings and to participate in deciding important matters in respect to environmental damage which extends beyond borders.

12142
CSO: 5100

AMPLE URANIUM SUPPLY SEEN EVEN WITHOUT IMPORTS FROM CANADA

Hamburg DIE ZEIT in German 22 Aug 80 p 19

[By Wolfgang Hoffmann: "Into the 1980's With Confidence. The FRG Can Get By Without Canada's Uranium"]

[Excerpt] At the end of the year the contract between Canada and Euratom for delivery of uranium to EC countries will expire. Euratom is the community authority responsible for supplying EC countries with fuel and watching to see that nuclear substances are in fact used only for peaceful purposes. Negotiations between Euratom and Canada are, of course, planned, but there are as yet no specific dates.

But it is very certain that the key issue in the new agreement with Euratom--the slogan "safety first"--will be a source of intense wrangling. Ottawa continues to demand what Euratom finally succeeded in averting in the 1977 negotiations: national supervision of all quantities of uranium supplied by Canada within the overall fuel system (primarily in the reprocessing of burned fuel) and also a veto in respect to passing uranium technology on to third countries. These demands go far beyond the current very strict security regulations, which were also accepted by the FRG in the so-called nonproliferation treaty. What the Canadians are demanding exceeds even the German philosophy of security, which is even stricter than what is provided for in the nonproliferation treaty.

In fact Bonn has always made certain that German security features will always be included in relevant nuclear treaties with foreigners. However, even in the FRG there is no remedy for a breach of contract. And bringing in German troops is hardly recommended. If, in the name of Euratom, Bonn or Brussels should comply completely with the Canadian veto demands, then this means that in the future German nuclear exports will be remotely controlled by Ottawa, an absurdity at least among allies.

But what will happen if the Canadians, in the impending negotiations about a new delivery contract with Euratom, insist on their current point of view, if there is no agreement and if the deliveries of uranium once again are halted as in 1977? Is the FRG then threatened with shutting down the nuclear power plants? Not at all.

--First, at present the FRG's fuel inventories are so well padded that the nuclear power plants would easily be able to manage for 3 years without Canadian uranium.

--Second, at present there is an excess supply of uranium in the world market which is reflected even in drastically lower prices. Uranium which cost $44 per pound in summer 1979 is avilable now at $31.50. The reason is the worldwide lull in the new construction of nuclear power plants.

--Third, the FRG orders nuclear fuel from so many sources that the absence of Canadian natural uranium can be definitely coped with. Of course, the Canadians do supply the FRG with about 60 percent of its natural uranium requirements, but that is only 10 percent of the total required nuclear fuels.

Moreover, in the meantime a new supplier of uranium for Europe is looming over the horizon. Australia, which, following the United States and South Africa, has the largest reserves of natural uranium, has decided to accelerate mining of its uranium reserves on a grand scale and with a great deal of money. Euratom, the EC authority, has been negotiating for a rather long time with the Australians, and the third round of negotiations is almost at hand; it will take place in September.

Of course, Australia also imposes rigid safety conditions on its customers in order to avoid proliferation of atmoic weapons. In terms of the current situation, the Europeans are prepared to offer the Australians a formula which will accommodate Australian security efforts without obstructing European nuclear export. This will guarantee that the Australians will always have detailed information about what is happening with their uranium.

If the Europeans reach agreement with the Australians on this basis, this could also be the solution for the European-Canadian problems, especially since Canada definitely also has a solid interest in the fact that Europeans buy uranium. A halt to Canadian deliveries, of course, means giving up the annual income from uranium exports on the order of roughly one-half billion marks. A spokesman for the German Atomic Forum says somewhat optimistically: "We are certain that the expiring contract will be extended with some modifications."

12124
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NUCLEAR PLANT ENERGY PRODUCTION FAILS TO MEET FORECASTS

Helsinki HELSINGIN SANOMAT in Finnish 27 Aug 80 p 8

[Article: "Production of Nuclear Energy Remains at Half Projected Amounts]

[Text] Porvoo (HS) The share of nuclear electricity in Finland's electric production will remain at half the projected amount this year. Only one out of the four completed nuclear plants is in operation, and it too goes out of production for months at a time. Thus the share of nuclear power in electricity production will be at most 15 percent of electricity production for the whole country.

In spite of this year's setbacks, the power companies are still talking seriously about the economy of nuclear power. So far, of the completed plants at least Loviisa 1 has been a real "golden egg," even though it has not produced any electricity in three months.

Before this year's extended annual maintenance, Loviisa 1 had been in operation for 3 years. During its time in operation, the plant has produced electricity to the amount of its own cost, over a billion marks.

Both Loviisa powerplants were obtained from the Soviet Union at a relatively low price compared to international levels. It is supposed that a reason for the Soviet Union's offer was a desire to sell some of their own plants to western markets.

Because of its low cost, the Loviisa plant is expected to pay for itself in 10 years. On the other hand, electricity produced by the first of Industrial Power's Olkiluoto plants has come out notably more costly than that from Imatra Power's Loviisa plant.

The first reactor of TVO [Industrial Power Company] achieved output near its maximum only during 5 months of last year. For half a year it was run at half power.

TVO's second nuclear powerplant has fallen behind its original schedule by about a year, because the rotor, now under repair, will be received back from Sweden perhaps in October, according to estimates of Asea Atom. If present schedules are kept, Loviis's second nuclear plant as well as TVO 2 will achieve full output only by year's end at the earliest.

Of all the nuclear power plants in Finland, Loviisa 2 is most behind schedule. Imatra power has postponed starting it up month after month for 2 and 1/2 years. The company announced already in August of last year that the powerplant would be started in September of October. Now IVO [Imatra Power Company] believes again that the plant can be started up next month.

From the time a nuclear power plant is made "critical" until it reaches full production of electricity takes 2-3 months. So at best Loviisa 1 [sic] can reach full production by the end of the year, just like TVO 2.

Study of boiler defects in Loviisa 2 [sic], which was in service for 3 years, and of possibilities for correcting them are continuing. According to operations chief Anders Palmgren, there is no exact timetable for starting up the second powerplant. "Perhaps the second power plant can be started up during October."

The defects in Loviisa 2 are in the radioactive part of the nuclear power plant. For this reason, an automatic welder was obtained from West Germany. But the welder will probably have to wait for suitable tasks.

According to Palmgren, the defects at Loviisa will probably be repaired without the automatic welder.

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BRIEFS

NEW SOVIET REACTOR FAULTS--Signs of welding defects have once again been found in the number 1 power plant at Loviisa. The shut-off valves of all six steamers in the power plant will now have to be inspected for defects. Loviisa 1 has been shut down since May because of annual maintenance. The plant was supposed to be put back into operation in October, but these new findings mean a postponement. "Now we are trying to make it operational before the end of the year," states Operations Chief Anders Palmgren of Loviisa 1. Loviisa 2 was in operation for a while during a test run, at which time the defects in unit 1 brought even it to halt. Until now the results obtained from one of Loviisa's units has always meant that corresponding inspections are also conducted in the other unit. Signs pointing to defects have for the time being been found in the main shut-off valves of the steamers. In addition to this, the seams of the emergency cooling system and primary piping network and pressure system have been examined. The new defects became evident when Imatra Power conducted an inspection of defects in the steamer system in June. Imatra Power has not yet submitted a report of this matter to the Radiation Safety Institute, but has kept the institute informed through verbal and written messages, states Radiation Safety Institue Director Antti Vuorinen. [Text] [Helsinki HELSINGIN SANOMAT in Finnish 9 Sep 80 p 3] 10576

CSO: 5100

NETHERLANDS

TERWISSCHA VAN SCHELTINGA EXPLAINS ANTINUCLEAR STANCE

Rotterdam NRC HANDELSBLAD in Dutch 19 Sep 80 p 7

[Report on interview with F.J.A. Terwisscha van Scheltinga by An Salomonson, editor of NRC HANDELSBLAD]

[Text] In April of this year Minister Van der Klaauw appointed one of his top officials, Dr F.J.A. Terwisscha van Scheltinga, as ambassador for nonproliferation questions. The minister thus responded to the Mommersteeg motion, passed by the Second Chamber at the beginning of 1979, which urges close coordination of the nonproliferation policy, which is aimed at checking the spread of nuclear weapons. That motion was definitely not unwelcome in government circles. More and more different ministries have become involved in that policy: in addition to the Ministry of Foreign Affairs, the Ministries of Development Aid, Defense, Economic Affairs, Social Affairs, and Public Health. Nonproliferation matters are coming up in more and more international agencies. The need for a key figure that could gather all those threads together has been more strongly felt because nuclear weapons problems hold special interest for parliament and parliamentary constituencies.

F.J.A. Terwisscha van Scheltinga, 57, originally a political scientist, since 1949 an official in the Ministry of Foreign Affairs, will as "ANPO" (to use his semiofficial title) stimulate and coordinate the nonproliferation policy and represent it externally. For support he has a departmental task force and an interdepartmental study group of which he is chairman. In the past Terwisscha has been personally involved in the peace movement. Among other things, he was a member of the board of Pax Christi and of the Interchurch Peace Council, which he found very stimulating.

> He keeps the thought going, he says. He has difficulty with the present position of the IKV [Interchurch Peace Council] with regard to nuclear weapons and NATO membership: "I can no longer follow that position. Its applicability is not sufficiently present for my work."

"We must move toward a new international nuclear consensus." Ambassador Terwisscha van Scheltinga, still confined in a bare room on a noisy street while waiting for an ANPO office of his own in the main building, expressly avoids the word "order." It is precisely consensus he is interested in, after the ever sharper confrontation of the last few years between the western industrial countries with their exclusive nuclear technology and the Third World, which wants to share in the profits of that technology but cannot.

The nuclear supplier countries, worried by the explosion of India's first atomic bomb in 1974 and by the plutonium that was piling up everywhere as if it were nothing, put stricter and stricter conditions on their exports in the 1970's. America even called for revision of the existing agreements. That stirred up the necessary ill feeling and was criticized in the Third World as a hateful neocolonialism. At the same time a large number of countries moved in the direction of nuclear autarchy, so that from then on they could get along without the west and its humiliating requirements.

"The great dilemma of our time is that you cannot help putting strict conditions on nuclear exports in order to eliminate the risk of proliferation, but that those conditions, when they are enforced, play right into the hand of autarchy," Terwisscha says.

The only solution, he believes, is a network of new agreements for tomorrow's nuclear world trade, with as many countries as possible involved, particularly including countries that have not yet joined in the non-proliferation treaty (NPT).

Uncertainty

The ANPO, looking candidly at me with his blue eyes, expresses the hope that such a network will come into being in the CAS--in full, the Committee for Assurance of Supply. It is a new committee of the International Atomic Energy Agency (IAEA), in which all countries that desire it will be represented. Including non-NPT countries such as Brazil, Argentina, India, and Pakistan, which have almost or quite passed the threshold to the status of nuclear-armed states. On 29 September 29 September 1980 the CAS will meet for the first time, in Vienna, of course, the seat of the IAEA.

Terwisscha says, "One of the big troubles of the nuclear purchaser countries is the continuing uncertainty in which they find themselves with regard to the supply of fissionable material. The CAS must set up rules by which an ensured and predictable supply of nuclear material can be guaranteed to the purchasers and still in accord with non-proliferation considerations."

Terwisscha feels it very important that the NPT review conference, which after meeting for 4 weeks ended in Geneva at the beginning of September without issuing a final document, did adopt in its second commission a resolution in which it called for the broadest possible consensus on new nonproliferation rules within the framework of the CAS.

Yugoslavia

The discussions in the CAS will certainly continue into 1982, the ambassador believes. In 1983 the United Nations will arrange an international conference on the peaceful use of nuclear energy--on the initiative of Yugoslavia, which always functions as front runner in the nuclear protest movement. "The hope exists that the new international nuclear consensus will be cemented at the UN conference. How the ball will roll I do not know. It is a matter of maintaining the balance in coming years between the commercial and industrial interests, i.e. legitimate interests, on the one hand, and security considerations on the other."

He does not mean to be pessimistic. In another of the IAEA's study groups, he emphasizes, where an arrangement is being worked out for international storage of plutonium, there has been very good success thus far in keeping that balance in equilibrium. But it is inflammable material, after all. It can fail.

One thing is sure, according to Terwisscha. An acceleration and also a broadening are perceptible in the movement in favor of "full scope safeguards." Those are security measures that include a check on *all* nuclear activities in a given country. Then misuse is practically ruled out, is the underlying thought. For countries that have joined in the NPT, "full scope safeguards" apply automatically. The nuclear producers have tried over and over to set those conditions for non-NPT countries as well. Such countries as, e.g., India and Brazil have stubbornly refused.

"At the review conference in Geneva the general feeling was definitely for 'full scope safeguards.' The commission concerned also adopted that as a policy objective in so many words. A pronouncement in which the nuclear exporters were asked to demand 'full scope safeguards' unilaterally as soon as possible was not tenable. Then you would again have the Third World and other purchasers protesting because something was being imposed on them. They want to be involved themselves.

"The Dutch position is that no adequate new international nuclear consensus can come about without 'full scope safeguards.' In addition, the arrangement for international storage of plutonium, which is progressing quite well, will also have to find a place in the new nuclear commerce system.

"Lastly, in our eyes agreements on multinational control of sensitive nuclear installations are also important." (Installations where enriched uranium and plutonium, the tow raw materials for a nuclear weapon, are produced.--editors). Terwisscha considers our tripartite effort, the cooperation of the Netherlands with England and the FRG in enrichment of uranium by the ultracentrifuge process, a splendid example of such a multinational framework.

Tripartite Cooperation

That group of three will occupy his attention for a while. Urenco's future export policy and the possible collaboration with Australia are two crucial matters that will come up this fall. Other problems on the agenda are: The controversial contracts for enrichment of burned-out rods of fissionable material in the Dodewaard and Borssele nuclear power plants. And, not to be forgotten, the consultation with the Second Chamber on such explosive problems as nuclear policy within the EC, the way in which plutonium storage must take shape, and the policy conclusions of INFCE [International Fissionable Material Cycle Evaluation]. The results of the broad international discussion of advantages and disadvantages of the present fissionable material cycle, completed this spring after a good 2 years' meetings with a flood of recommendations, are at the moment giving governments and parliaments in all the world's capitals, including The Hague, a great deal to think about.

Does our ANPO find the Second Chamber's great interest in nuclear matters stimulating, or a bothersome pot-watching? "We are dealing here with widely diversified, technically and politically complicated matters. We have seen that in connection with the international plutonium storage system. It must be hoped that both parties will be able to work on the basis of a complete mastery of the problems. If that is the case, I find that the dialog with parliament is a good thing. For the ministry's part, we make sure that the Second Chamber is well provided with information. I venture to say that no other western government has informed its parliament in such detail about the INFCE, provided translations, and formulated policy conclusions as we have done. We found it important to take a few members of parliament along to a review conference in Geneva. That way we created optimal conditions for a good discussion of nonproliferation. As for what the Second Chamber will do, well, we shall have to wait and see."

8815
CSO: 5100

VVD CONGRESS OPTS FOR MORE NUCLEAR POWER STATIONS

Rotterdam NRC HANDELSBLAD in Dutch 6 Sep 80 p 2

> [Text] Enschede, 6 September--The VVD [People's Party for Freedom and Democracy] must hold open the possibility of constructing new nuclear power stations. By a bare majority (583 to 449 votes), the general membership meeting of the VVD at its second congress on the liberal manifesto set forth that position yesterday at Enschede.

After that, the congress stiffened the party's position appreciably. A reserved position with respect to nuclear power was included in the proposal by the Geertsema Committee [the VVD platform committee].

The Geertsema Committee did not speak out expressly for nuclear power but stressed that first solutions would have to be found for safe plant operation and safe storage of radioactive materials. Besides that, the committee wanted more attention for alternative forms of energy.

The congress restricted the conditions for the application of nuclear energy to the statement that in the construction of new power plants the outcome of so-called broad social discussion and the degree to which the problems concerning the storage of radioactive wastes and the safety of the power plants had been solved would have to be taken into account.

A proposal against the storage of nuclear wastes in salt domes was voted down.

The VVD congress also stated that it was in favor of a legal regulation of abortion. This statement was put forth by the party leadership as support by the rank and file for cooperation with an abortion porposal introduced this week by the PvdA [Labor Party] and the D'66 [Democrats of 1966], should the cabinet proposal by the CDA [Christian Democratic Appeal] and the VVD fail to gain a majority.

The general membership meeting resolved--as does the PvdA/D'66 proposal--that the final decision about abortion rests with the woman. Besides that, a suggestion was accepted that unwanted pregnancies be prevented as far as possible through the distribution of information and assistance.

The congress rejected the legislative determination of a right to passive and active euthanasia. However, it was adopted into the manifesto as a liberal assumption that a person has the right to decide himself "in what manner and at what time he wishes to end his life."

On the issue of social health, the congress also adopted into the manifesto a proposal that the rights of the patient must be regulated. It also spoke out in favor of the right of the patient to be allowed to inspect his own medical dossier.

In the paragraph on social health, the congress scrapped the passage on the medical right of redress. The concept of the right of redress was seen to be "medieval" and "moralizing." A plea was made that new ideas be developed within the party about the right of redress.

On the issue of work, the congress determined that socially useful work --work that falls outsice the classical concept of paid work--must entail a right to an income. However, an income in the form of a benefit payment must be "significantly lower" than the social security benefit payments.

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CSO: 5100

BRIEFS

NUCLEAR WEAPONS POSSESSION UNACCEPTABLE--Utrecht, 15 September--Not only the use but also the possession of nuclear weapons is unacceptable. A declaration to that effect was adopted Saturday [13 September] in Utrecht by the council of the Humanist Union. The Humanist Union finds that the making of a moral distinction between use and possession of nuclear weapons is not acceptable. The possession, according to the union, means in fact the readiness to use nuclear weapons. Moreover, possession of nuclear weapons leads to a perfecting and spread of nuclear weapons. In addition, according to the humanists, the costs of the arms race are so high that a considerable part of the capital and natural resources needed for it is beyond the reach of the developing countries. This is in conflict with the demands of solidarity and the brotherhood of man, the union says. The humanists point out that possession of chemical and biological weapons is as objectionable as use of them. The Humanist Union will not leave the fight against nuclear weapons to politics. But the union does expect Dutch politicians to try to break through the traditional security thinking thinking in the world. [Text] [Rotterdam NRC HANDELSBLAD in Dutch 15 Sep 80 p 2] 8815

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October 29, 1980

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